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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/548,213	04/12/2000	Kouichi Matsuda	122.1203-Re	6182

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EXAMINER

TIBBITS, PIA FLORENCE

ART UNIT PAPER NUMBER

2838

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**COPIES OF REFERENCES ORDERED**

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# Office Action Summary

Application No.

09/548,213

Applicant(s)

MATSUDA ET AL.

Examiner

Pia F Tibbits

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-147 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-34, 89-112, 118-129 and 133-147 is/are allowed.
- 6) ☒ Claim(s) 35-88, 113-117, and 130-132 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/578,805.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 16
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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### **DETAILED ACTION**

This Office action is in answer to the response filed June 11, 2002, and to the interview that took place July 16, 2002, a summary of which is hereby attached.

#### ***Response to Arguments***

1. Applicant's arguments filed on June 11, 2002, as well as the discussion that took place during the interview of July 16, 2002 have been fully considered and the results are as follows:

a) In response to Applicant's arguments, the restriction of claims 118-147 has been withdrawn.

b) In response to Applicant's arguments and further consideration, the 112 rejections have been withdrawn.

c) The disclosure of WO 93/19508 is not adequate for a rejection.

d) The claims of the instant application could be classified into two categories according to the matter they teach: 1) claims 1-34, 89-112, 118-129, and 133-147 which teach an apparatus for controlling power to a battery as the current to a load varies, and 2) claims 35-88, 113-117, and 130-132, which teach adjusting a charging power based upon an input voltage. The claims that are part of the first category have been allowed; the claims that are part of the second category have been rejected by using a new reference, as described below.

#### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, **the remaining-amount determining section** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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***Specification***

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. For example, current measuring circuit 50 (column 14, line 29) is described with the same reference number as the rechargeable battery 50. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 35, 36, 37, 50-53, 54, 55, 68-71, 72, 73, 86-88, and 130-132 are rejected under 35 U.S.C. 102(e) as being anticipated by **Frederick et al. [5327071]**.

Frederick discloses in fig. 2 a system for controlling the operating point of a **solar cell or array/power supply** such that it operates at its power maximizing voltage  $V_{MP}$ , thereby maximizing the transfer of power between the cell or array and a battery or load(s). The system includes a tracker unit 26 arranged to receive electrical power generated by solar cell array 20 and to provide the **load(s) 22** and **battery 24** with **direct current power** such that **the output power** of the solar cell array 20 is **maximized**. **The tracker unit 26 serves to decouple the solar cell array 20** from the load(s) 22

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and the battery 24 in order that the load(s) and battery may operate at a voltage independent of the solar cell array, and the solar cell array may operate at its most efficient point. This most efficient operating point for the array 20 may be located by **controller 28** according to a method, wherein a value of power output by the array to a load or battery bus is measured at different operating points of the array, and the measured power values are compared until the peak power point for an array string is located. A current sensor 30 on bus 32 measures the power output, to the battery or load. The current output on bus 32 represents the power output by the array 20 because the voltage output is essentially predetermined based upon the voltage at which the battery 24 or loads 22 operate. Therefore, since **power=(voltage) times (current)**, and the voltage at the battery 24 or loads 22 is relatively constant, current serves as an indication of the power output. Controller 28 (which may comprise any type of programmable computing device capable of receiving input signals and outputting a control signal) receives a signal indicating the power on the bus 32 from current sensor 30 and outputs a control signal, on line 36 to tracker unit 26. The control signal 36 serves to adjust a tracker unit 26 set point voltages, which will cause the array 20 voltage to change as well. This in turn will cause the power output from the tracker unit 26 to vary. Thus, the current sensor 30, controller 28 and tracker unit 26 form a closed loop system whereby the current output by tracker unit 26 may be iteratively adjusted **until the maximum power output of solar cell array 20 is obtained.**

Frederick also discloses in fig.4 the power tracker unit 26 including a **DC-DC buck converter/regulator 60**, a pulse width modulator 62, a differential amplifier 64, a capacitor 72 and a capacitor 74. The positive side output from the buck converter 60 is connected to the positive side terminal of the power source/solar array string 26. The peak power tracker unit may use a pulse width modulated DC/DC converter to transfer power from the power source to the battery or load. The input voltage to the tracker unit is controlled by the pulse width modulation duty cycle, which is in turn controlled by a differential signal, which compares the power source voltage with a control voltage provided by a controller. The controller periodically adjusts the control voltage upwards and downwards by a small amount and compares the power out of the solar array string at each of the control voltages.

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Whichever control voltage produces a greater power output becomes the point at which the string is set to operate. The process of adjusting the control voltage is iteratively repeated until the maximum power output point for a power source is achieved.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 38-49, 56-67, 74-85, and 113-117 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Frederick**, as described above, in combination with prior art cited by applicant, **Brainard [5371456]**.

Frederick discloses a system for controlling the operating point of a power supply such that it operates at its power maximizing voltage, and thus maximizing the transfer of power to a battery or a load. Frederick does not disclose a switch to turn on/off the supply of power to the battery (claims 38-40), detecting a charging current to the battery (claims 41-46, 59-64, 77-82), the charging current being equal to or lower than a current value assigned to the battery, an AC adapter/power source (claims 47-49, 65-67, 83-85), a switch to turn on/off the supply of power to the battery (claims 56-58, 74-76), and a resistor for detecting a charging current (claims 113-117).

Brainard discloses in fig. 1A, a portable computer 1 using a power supply that includes an **AC adapter 2** (an external AC/DC switcher), a **current limiter 3/detector** to limit the current to a battery, and diodes 4 to isolate the battery 5 from the raw supply voltage. Fig. 2 illustrates a block diagram of a battery charger and power system 100 for use with a load. Charger 300 further comprises a primary section 302 and a secondary section 304. Within secondary 304 there are a power rectifier and filter unit 306, a **charge sensing and control circuit 308**, and a signal control circuit 310. **The**

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**charge rate sensor** comprises a **variable resistance value** and a **voltage detector** for measuring **the voltage across the resistor while the battery is charging**. The variable resistance value allows the battery to rapid charge, trickle charge, or discharge (power the load). A charge monitor, connected to the battery and coupled to the power controller, monitors the battery during charging and signals the power controller the state of charge on the battery. Based on the monitoring by the charge monitor, the charge monitor and power controller place the battery into a rapid charge, trickle charge, or power discharge state. The charge monitor uses either a temperature sensing system, a change of voltage sensing ( $-\Delta V$ ) system, or a charge timing system, or any combination of the three. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include Brainard's teachings in Frederick's system in order to be able to detect the charging current to the battery, and prevent overcharging the battery.

Brainard discloses in fig. 1B a **FET switch** in the negative lead of the battery. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include Brainard's teachings in Frederick's system in order to be able to control when the battery becomes fully charged and/or remove it from the charging circuit by turning off the FET switch.

With regard to claims 38-40: the limitation of having a switch to turn on or off the supply of charging power, it is an inherent function of the system described above by Frederick, to continuously monitor the output voltage of the power supply, and switch it on or off through the tracker unit, and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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***Allowable Subject Matter***

9. Claims 1-34, 89-112, 118-129, and 133-147 are allowed.

With respect to claims 1-34, 89-112, 118-129, and 133-147: none of the references of record **prior to applicant's filing date** discloses, teaches, or suggests an apparatus for **controlling power to a battery as the current to a load varies**, as detailed by the instant application.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related apparatus.

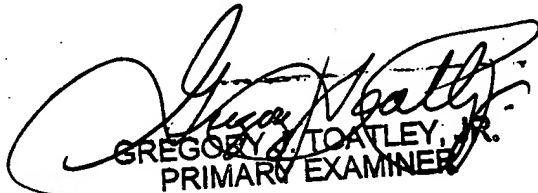
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Pia Tibbits whose telephone number is (703) 308-7305. If unavailable, contact the Supervisory Patent Examiner Robert Nappi whose telephone number is (703) 308-3370.

12. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications only may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 308-7722 or (703) 308-7724.

PFT

July 17, 2002

  
GREGORY J. TOATLEY, JR.  
PRIMARY EXAMINER